ABSTRACT OF THE DISCLOSURE

A method for reducing catalyst attrition losses in hydrocarbon synthesis processes conducted in high agitation reaction systems; a method of producing an attrition-resistant catalyst; a catalyst produced by such method; a method of producing an attrition-resistant catalyst support; and a catalyst support produced by such method. The inventive method of reducing catalyst attrition losses comprises the step of reacting a synthesis gas in a high agitation reaction system in the presence of a catalyst. In one aspect, the catalyst preferably comprises a γ-alumina support including an amount of titanium effective for increasing the attrition resistance of the catalyst. In another aspect, the catalyst preferably comprises a γ-alumina support which has been treated, after calcination, with an acidic, aqueous solution. The acidic aqueous solution preferably has a pH of not more than about 5. In another aspect, the catalyst preferably comprises cobalt on a γ-alumina support wherein the cobalt has been applied to the γ-alumina support by totally aqueous, incipient wetness-type impregnation. In another aspect, the catalyst preferably comprises cobalt on a γ-alumina support with an amount of a lanthana promoter effective for increasing the attrition resistance of the catalyst. In another aspect, the catalyst preferably comprises a γ-alumina support produced from boehmite having a crystallite size, in the 021 plane, in the range of from about 30 to about 55 Ångstrons. In another aspect, the inventive method of producing an attrition-resistant catalyst comprises the step of treating a γ-alumina support, after calcination of and before adding catalytic material to the support, with an acidic solution effective for increasing the attrition resistance of the catalyst. In another aspect, the inventive method of producing an attrition-resistant catalyst support comprises the step of treating calcined γ-alumina with an acidic, aqueous solution effective for increasing the attrition resistance of the γ-alumina.